

POLICY RESEARCH WORKING PAPER

WPS 2130

2130

Deep Integration, Nondiscrimination, and Euro-Mediterranean Free Trade

*Bernard Hoekman**Denise Eby Konan*

Preferential trade agreements that are limited to the elimination of tariffs for merchandise trade flows are of limited value at best and may be as easily welfare-reducing as welfare-enhancing. It is important that preferential trade agreements go beyond eliminating tariffs and quotas to eliminating regulatory and red tape costs and opening up service markets to foreign competition.



Summary findings

“Deep integration” — explicit government actions to reduce the market-segmenting effect of domestic regulatory policies through coordination and cooperation — is becoming a major dimension of some regional integration agreements, led by the European Union. Health and safety regulations, competition laws, licensing and certification regimes, and administrative procedures such as customs clearance can affect trade (in ways analogous to nontariff barriers) even though their underlying intent may not be to discriminate against foreign suppliers of goods and services.

Whether preferential trade agreements (PTAs) can be justified in a multilateral trading system depends on the extent to which formal intergovernmental agreements are *technically necessary* to achieve the deep integration needed to make markets more contestable. The more need for formal cooperation, the stronger the case for regional integration.

Whether PTAs are justified regionally also depends on whether efforts to reduce market segmentation are applied on a nondiscriminatory basis. If innovations to reduce transaction or market access costs extend to both

members and nonmembers of a PTA, regionalism as an instrument of trade and investment becomes more attractive.

Using a standard competitive general equilibrium model of the Egyptian economy, Hoekman and Konan find that the static welfare impact of a “deep” free trade agreement is far greater than the impact that can be expected from a classic “shallow” agreement. Under some scenarios, welfare may increase by more than 10 percent of GDP, compared with close to zero under a shallow agreement.

Given Egypt’s highly diversified trading patterns, a shallow PTA with the European Union could be merely diversionary, leading to a small decline in welfare. Egypt already has duty-free access to the European Union for manufactures, so the loss in tariff revenues incurred would outweigh any new trade created.

Large gains in welfare from the PTA are conditional on eliminating regulatory barriers and red tape — in which case welfare gains may be substantial: 4 to 20 percent growth in real GNP.

This paper — a product of the Development Research Group — is part of a larger effort in the group to analyze regional integration agreements. Copies of the paper are available free from the World Bank, 1818 H Street NW, Washington, DC 20433. Please contact Lili Tabada, room MC3-333, telephone 202-473-6896, fax 202-522-1159, Internet address ltabada@worldbank.org. Policy Research Working Papers are also posted on the Web at <http://www.worldbank.org/html/dec/Publications/Workpapers/home.html>. The authors may be contacted at bhoekman@worldbank.org or konan@hawaii.edu. May 1999. (37 pages)

The Policy Research Working Paper Series disseminates the findings of work in progress to encourage the exchange of ideas about development issues. An objective of the series is to get the findings out quickly, even if the presentations are less than fully polished. The papers carry the names of the authors and should be cited accordingly. The findings, interpretations, and conclusions expressed in this paper are entirely those of the authors. They do not necessarily represent the view of the World Bank, its Executive Directors, or the countries they represent.

Deep Integration, Nondiscrimination, and Euro-Mediterranean Free Trade*

Bernard Hoekman
World Bank and CEPR
1818 H St. N.W., Washington, DC 20433
bhoekman@worldbank.org; Tel: 1 202 473 1185; Fax: 202 676 9810

Denise Eby Konan
University of Hawaii
2424 Maile Way, SSB 542 Honolulu, HI 96822
konan@hawaii.edu; Tel: 1 808 956 6310; Fax: 808 956 4347

JEL Classification: F13

Keywords: preferential trade agreements, deep integration, trade in services, non-tariff barriers, Egypt, Arab League

*Presented at the conference Regionalism in Europe: Geometries and Strategies After 2000, Bonn November 6-8, 1998. We are grateful to Joe Francois, Giorgia Giovannetti, Keith Maskus, and participants at the conference for helpful comments and suggestions and to Sandy Yeats and Francis Ng for data.

Non-Technical Summary

“Deep integration”—explicit actions by governments to reduce the market segmenting effect of domestic regulatory policies through coordination and cooperation—is becoming a major dimension of some regional integration agreements, led by the EU. Health and safety regulations, competition laws, licensing and certification regimes, and administrative procedures such as customs clearance practices can have effects analogous to nontariff barriers (NTBs) to trade, even though the underlying intent may not be to discriminate against foreign suppliers of goods and services. Often integration can be pursued unilaterally through decisions by governments to recognize a partner’s policies or to adopt a partner’s regulatory stance in specific areas (harmonization). But deeper integration may also require far-reaching cooperation and “sharing” of sovereignty.

A key question in evaluating the justification for preferential trade agreements (PTAs) from a multilateral trading system perspective is the extent to which formal intergovernmental agreements are *technically necessary* to achieve the deep integration necessary to promote greater contestability of markets. The more this is so, the stronger the potential case for pursuit of regional integration. Another question that is relevant in evaluating the case for regionalism is the extent to which actions taken in the PTA context to reduce market segmentation can be and are applied on a nondiscriminatory basis. If PTA-based deep integration innovations to reduce transactions or market access costs extend to nonmembers as well as members of a PTA, this increases the attractiveness of regionalism as an instrument of trade and investment policy reform.

In this paper we investigate the potential importance of deep integration in the context of trade agreements the EU has concluded with Mediterranean countries. We consider the case of Egypt for illustrative purposes. The government is far advanced in negotiations with the European Union (EU) to establish a bilateral free trade agreement (FTA), and in 1997 agreement was reached in the Arab League to establish a FTA over a 10 year period starting in 1998. Neither of these agreements does much to pursue a deep integration agenda, although the EU FTA has the potential to do so. In this paper we quantify the magnitude of the opportunity costs of not doing so, taking into account that unilateral elimination of some regulatory barriers on a nondiscriminatory basis may not be feasible, and that Mediterranean countries may be able to improve market access opportunities in the EU if the agenda is “deepened”.

Given Egypt’s diversified trading patterns, a shallow PTA with the EU (limited to elimination of Egyptian tariffs) will lead to a small welfare decline. This reflects the fact that Egypt already has duty-free access to the EU for manufactures—the loss in tariff revenues that will be incurred outweighs any trade creation that will result. Large welfare gains from a EU FTA are conditional upon the elimination of regulatory barriers and red tape. If deep integration efforts are pursued that deliver such an improvement in the business environment, the welfare gains may be substantial, from 4 percent to upwards of 20 percent growth in real GNP. The variance in these impact results indicates that it is important to have a good sense of how large the regulatory costs are, whether elimination of regulatory barriers can be applied on a

nondiscriminatory basis, and whether the barriers create rents or are largely frictional (resource-wasting) in nature.

Our results suggest that the additional impact of services liberalization may be significant. Improvements in service efficiency lead not only to a gain in domestic welfare and output but also to an improved export position. The potential welfare gains to better access to European service markets may be quite substantial. Given low trade barriers in the EU and the relatively high tariffs maintained by Egypt and other Arab countries, there are also potentially large gains associated with intra-Arab trade liberalization. Here again much depends on the availability of accurate information on the actual trade policies of the Arab countries vis a vis each other. These are difficult to come by. To the best of our knowledge, no comparable cross-country empirical analyses have been undertaken to estimate what the tariff equivalents are of the various regulation-related trade costs that currently exist in the Arab region more generally. Without such empirical work—which should span both product and service markets—computational work of the kind attempted in this paper will necessarily be subject to large margins of error.

Despite the weakness of the datasets that are available, the major points that emerge from the analysis are fully consistent with the economic theory and analytical models. PTAs that are limited to the elimination of tariffs for merchandise trade flows are of limited value at best, and may as easily be welfare reducing as welfare enhancing. It is important that PTAs go beyond elimination of tariffs and quotas to include regulatory and red tape costs, as well as efforts to open service markets to foreign competition. Both policymakers and analysts must take into account that some types of “red tape” stemming from the enforcement of regulatory regimes cannot be eliminated unilaterally on a nondiscriminatory basis. To the extent that this is the case, account must be taken of the need to negotiate formal recognition agreements and equivalent instruments. These may give rise to large gains, but should be pursued on a nondiscriminatory basis, i.e., in the WTO context.

1. Introduction

There is an extensive literature on the economics of preferential trade agreements (PTAs). One strand of this literature emphasizes the role of PTAs as instruments used by governments in the pursuit of “deep integration” (e.g., Lawrence, 1996), which for purposes of this paper is defined as explicit actions by governments to reduce the market segmenting effect of domestic (non-border) regulatory policies through coordination and cooperation. Examples are health and safety regulations, competition laws, licensing and certification regimes, prudential requirements, environmental norms, and administrative procedures such as customs clearance practices. Such regulatory policies have effects analogous to nontariff barriers (NTBs) to trade, even though the underlying intent may not be to discriminate against foreign suppliers of goods and services. Indeed, the regulations concerned may apply equally to domestic and foreign products or producers, in contrast to standard NTBs. Nonetheless, they can act to segment markets and reduce competition.

The regulatory barriers and measures that figure on the “deep integration” agenda often belong to the class of market segmenting policies that either impose real resource or frictional costs on international exchange of goods and factors, or prohibit new entry on markets altogether. Often integration can be pursued unilaterally through decisions by governments to recognize a partner’s policies or to adopt a partner’s regulatory stance in specific areas (harmonization). But deeper integration may also require far-reaching cooperation and “sharing” of sovereignty. A key question in evaluating the justification for PTAs from a multilateral trading system perspective is the extent to which formal intergovernmental agreements are *technically necessary* to achieve the deep integration necessary to promote greater contestability of markets.

The more this is so, the stronger the potential case for pursuit of regional integration. Another question that is relevant in evaluating the case for regionalism is the extent to which actions taken in the PTA context to reduce market segmentation can be and are applied on a nondiscriminatory basis. If PTA-based deep integration innovations to reduce transactions or market access costs extend to nonmembers as well as members of a PTA, this increases the attractiveness of regionalism as an instrument of trade and investment policy reform.

This paper investigates the potential importance of deep integration in the context of trade agreements the EU has concluded with Mediterranean countries. It is sometimes argued these PTAs will be detrimental to Mediterranean countries because they will give rise to trade diversion (Schiff, 1997). But if a Euro-Mediterranean agreement (EMA) reduces regulatory impediments in both the EU and partner country markets, the potential welfare gains may increase substantially.

We consider the case of Egypt for illustrative purposes, largely driven by the fact that a significant amount of analytical work on Egypt already exists (Maskus and Konan, 1997, Hoekman, Konan and Maskus, 1998). The government is far advanced in negotiations with the European Union (EU) to establish a bilateral free trade agreement (FTA),¹ and in 1997 agreement was reached in the Arab League to establish a FTA over a 10 year period starting in 1998.² Neither of these agreements does much to pursue a policy integration agenda, although the EMA has the potential to do so. One motivation for this paper is to quantify the magnitude of the

¹ Such FTAs have already been concluded between the EU and Israel, Jordan, Morocco, the Palestinian Authority, and Tunisia. Discussions are ongoing with Algeria, Egypt, Lebanon and Syria. See Galal and Hoekman (1997) for assessments of the Tunisian and Moroccan agreements and analysis of the issues for Egypt.

² The recent Arab League FTA may to some extent have been motivated by a desire to avoid the negative implications of an emerging "hub and spoke" network of bilateral Euro-Med agreements.

opportunity costs of not doing so, taking into account that unilateral elimination of all regulatory barriers on a nondiscriminatory basis may not be feasible.

The plan of the paper is as follows. Section 2 reviews a number of conceptual issues that arise in the context of policy integration. Section 3 describes the status quo policies in Egypt that characterize the benchmark for simulation analysis. Section 4 describes the model, datasets, and the main scenarios that are evaluated. Section 5 reports the results of the simulation analyses. Section 6 concludes.

2. Conceptual Issues

As tariffs and related “traditional” trade barriers decline in importance, industries have started to focus on the consequences of differences in regulatory regimes across countries for their ability to compete. Regulatory regime differences may have consequences for the degree to which the contestability of markets is enhanced following a significant reduction or the complete elimination of trade control measures. Commonly mentioned examples concern the prevalence of state-owned or controlled industries/firms, the extent to which governments subsidize the activities of domestic industry, and the competition policy (antitrust) regime that applies. The greater the role of the state in the economy and the more tolerant a government is of anticompetitive business practices such as cartels, bid rigging and other horizontal restraints, the less impact a formal elimination of trade barriers may have on the contestability of markets.

Although the market segmenting effects of regulatory policies may be intentional, in many cases this simply is a side effect. For example, the enforcement of health and safety standards requires testing and conformity assessment procedures for products. These presumably will apply equally to domestic and imported goods. But exporters may already be subject to

equivalent controls in their home country, so that testing is duplicative, leading to higher compliance costs for foreign firms. Customs procedures may also be duplicative insofar as paperwork and data requirements have already been demanded by authorities in the home country or are not relevant to the needs of customs. Such policies may therefore be largely resource-wasting and redundant.

It has been estimated that over 60 percent of US exports are subject to mandatory health, safety, and related standards. For exports to the EU, government-issued certificates were required for 45 percent of these goods, private, third party certification was accepted in 15 percent of cases, and for the remainder manufacturers self-certification sufficed (Wilson, 1998). Within the EU, some 75 percent of the value of intra-EU trade in goods is subject to mandatory technical regulations (European Commission, 1996). Conformity assessment policies may therefore constitute an important technical barrier to trade. Their prevalence has risen rapidly. The EU now requires third-party testing, certification, or quality system registration for certain regulated sectors by organizations designated, or “notified”, to the Commission by the member states as technically competent. Only these bodies can approve goods for circulation in European markets and affix the European “CE Mark” to certified products. Unter (1998) estimates that in the case of the Hewlett-Packard company redundant testing and conformity assessment procedures increased six-fold between 1990 and 1997. Similar situations apply to services producers, where the need for licensing and certification of suppliers and prudential supervision may be duplicated across countries. Often such requirements are complemented by outright market access restrictions for foreign providers. The result is generally higher cost supply and the creation of rents for domestic suppliers.

The major options for dealing with the market segmenting and/or anticompetitive effects of regulation are harmonization and acceptance (or “recognition”) of regulatory policy regimes. Each of these options may be pursued unilaterally or in a concerted manner. Harmonization may involve adoption by one country of another country’s set of rules, or the negotiation of a common set of disciplines that imply changes for both (or all) countries. Examples abound of unilateral or independent harmonization to the standard of a trading partner. These are often driven by market size disparities. An example was a 1992 decision by Canada to adopt the US emission standards for automobiles that were specified in the US Clean Air Act of 1990 so as to ensure that auto makers located in Canada could realize economies of scale (avoid having to set up separate production lines for the Canadian and US market). Another example driven by market access considerations was a decision Switzerland to adopt the EU regime on technical regulations and industrial standards (in effect the *acquis communautaire*). This ensured that Swiss goods can enter and circulate in the EU on the same basis as EU-produced goods (Messerlin, 1998).³ Numerous developing countries have pursued a unilateral harmonization strategy. Often this was done by maintaining systems inherited from a colonial past or military occupation, but more deliberate efforts have also been made. South Korea, for example, adopted many German and US technical product regulations in the 1950s, as part of a strategy to upgrade the quality of industrial production and foster exports.

Harmonization may also be based on inter-governmental cooperation and agreement, or involve a decision to cede sovereignty to common or supra-national institutions. The latter is often regarded in the literature as a necessary condition for economic integration to occur—

³ However, it did require a number of MRAs as well. Switzerland was put into a special situation because other EFTA members either joined the EU or the EEA. Under the EEA, EFTA members agreed to adopt the *acquis*,

Robson (1988) defines integration as “the assignment of particular economic functions and instruments to the union or community and their exercise at that level rather than at the level of the member states.” Supranational institutions may be involved in the process of setting the rules of the game (as in the case of the EU, where the Commission has been delegated the power of proposing directives and regulations), and/or the enforcement of negotiated commitments (e.g., acceptance by PTA member states of binding, independent third party adjudication or arbitration as in NAFTA; or more far-reaching, the creation of a supra-national institution such as the Court of Justice in the EU).

A complement of unilateral harmonization to the standards of a trading partner or international norms is unilateral recognition of foreign regulatory regimes. Thus, a government may decide that the professional qualifications of doctors trained and certified in certain countries are sufficient for them to practice (although nationality constraints and economic needs tests may still prohibit entry by foreign service providers). Similarly, a government may accept foreign certificates of safety for certain imports as sufficient proof of quality (e.g., the Underwriters Laboratories (UL) mark is accepted in many countries). However, the ability of unilateral recognition to reduce transaction costs is inherently limited to the jurisdiction of the government concerned. In some cases a government or regulatory body may not be familiar with or trust foreign certification systems, or may consider foreign standards to be unacceptable. If so, products will be subjected to testing and certification at point of entry into its jurisdiction, imposing additional costs on imports. Negotiation of *mutual* recognition agreements (MRAs) is a mechanism through which transactions costs can then be reduced further. MRAs may be required even if a harmonization strategy is pursued by a country, as the trading partner whose standards

which automatically implied accepting to apply EU standards.

are emulated may not accept foreign test results or conformity assessment systems as equivalent to its own, even if the formal standards are identical. Conversely, MRAs may require some degree of harmonization, especially in areas where mandatory standards or regulations apply, so as to ensure that the underlying norms satisfy certain basic, minimum standards.

An important empirical question is to determine the size of the potential benefits of regional deep integration initiatives. Relatively little work has been done on this, almost all of it focusing on the EU's Single Market Programme. One conclusion that emerges from this work (e.g., Winters 1992; Baldwin, 1995) is that the welfare impact of deep integration will be greater the more the restrictions being addressed waste real resources rather than generate rents that are captured by interest groups. If there is no rent or revenue for a country to lose by removing the restriction, gains will be greater from eliminating them than if the measures create rents. Estimates of average frictional costs in the EU prior to the Single Market programme ranged between 2 and 3 percent of the value of trade (EC, 1996). In some areas or sectors the figures were even higher. The requirement that conformity assessments be performed by European notified bodies—in limited cases the EU has authorized subcontracting by notified bodies to allow certification by foreign firms—raises the costs of testing and certification to non-EU manufacturers in some sectors. The 1997 US-EU MRA on telecommunications and information technology products has been estimated to eliminate frictional costs equivalent to a 5 percent “tax” on the value of the goods traded (Wilson, 1998). Such costs are likely to be higher in developing countries.

It is also important to determine to what extent regulatory reform can be achieved unilaterally as opposed to requiring formal, international agreements. Unilateral reforms may be sufficient to realize a significant share of the total potential gains from deep integration but can

only affect domestic markets (imports). Formal international agreements may have an impact in facilitating exports as well, as market access becomes less costly. How much more can be obtained from international cooperation as compared to unilateral reform is unknown. The same is true regarding the extent to which deep integration eliminates regulatory costs for importers and exporters on a nondiscriminatory basis. Both MRAs and harmonization decisions may be inherently discriminatory with respect to outsiders. In the former case, discrimination may be implied if recognition is not extended to some countries. Harmonization may increase barriers to trade for third parties if their national standards or norms differ from the common norm applied in the PTA. Consequently, it cannot be assumed that reductions in real costs associated with actions to reduce the market segmenting effect of differences in regulatory regimes will benefit nonmembers.

Much depends in this connection on the types of barriers that are involved. Some reductions in trade costs can be extended to all sources of imports. An example is simplification of customs clearance procedures and associated documentary requirements. Other liberalization actions will not automatically extend to third countries. Examples include decisions to link computer systems of Customs, accept self-declaration for purposes of enforcement of mandatory product standards and related testing and certification procedures or recognize professional qualifications.

Summing up, the impact of a PTA on members and the rest of the world depends importantly on the extent to which the market segmenting regulatory barriers are eliminated; whether these are frictional in nature, whether reforms can be pursued unilaterally, and whether policy integration benefits extend on a nondiscriminatory basis. The greater the share of frictional barriers in the total set of barriers that is removed by the PTA, the more market access

opportunities in partner country markets improve, and the greater the extent to which own barrier removal extends to imports from non PTA members, the more beneficial it will be. These are empirical questions or issues that should figure in any evaluation of a PTA. What follows makes an attempt to determine the possible quantitative importance of some of these factors using a CGE model of the Egyptian economy.

3. Egypt: Pattern of Trade and Micro Policy Distortions

Given the recent decision to establish an Arab League FTA and ongoing negotiations on a FTA with the EU, bilateral Egyptian trade flows are separated into four regions: the EU (including Turkey),⁴ the United States, the Arab League, and the rest of the world (ROW).⁵ The EU is Egypt's largest trading partner, accounting for roughly 40 percent of merchandise imports in 1995 and absorbing 45 percent of Egypt's exports. The US comes second in terms of imports, accounting for 19 percent of total imports, while the Arab League is the second most important export market for Egypt, absorbing 16 percent of all exports of goods in 1995. As shown in Table 1, in many product categories, including processed foodstuffs, wood products, paper and printing, glass and mineral products, transport equipment, more than 50 percent of total Egyptian exports go to Arab markets. In contrast, Egypt imports relatively little from the Arab League region. The most important in terms of import shares are petroleum products, beverages, and textiles and clothing. Despite their relatively large presence in production, vegetable foodstuffs and food processing are major import goods, as are machinery and chemicals. On the export side, Egypt's trade flows are dominated by transport services (largely because of the Suez Canal), oil, and tourism. Textiles and clothing are

⁴ Turkey is included in the EU grouping because Turkey has recently concluded an agreement to form a customs union with the European Union, implying that any FTA with the EU will automatically be extended to Turkey.

the major the exports of manufactures. Only 40 percent of merchandise exports to the EU comprise manufactured goods. These tend to be relatively low skill, labor-intensive. In product lines in SITC chapter 6 (products embodying materials like leather, fibers, wood or paper), the revealed comparative advantage index is above one, indicating that Egyptian firms have an above average share of world exports (Yeats, 1995). The intra-industry trade index with the EU in 1994 was 0.14, as compared to 0.28, 0.3, and 0.43 for Turkey, Tunisia and Israel respectively (World Bank, 1995).⁷

We draw two conclusions from these statistics. First, although the EU is by far the largest trading partner of Egypt, trade flows are rather diversified. The non-Arab, non-EU, non-US “rest of the world” provides 34% of imports and takes 25% of exports. These numbers suggest that the potential for trade diversion from a “classic” preferential trade agreement with just one of Egypt’s major trading partners is significant. Second, services play an important role in Egypt’s current account. As there are no disaggregated data available on services trade or its breakdown by region, for purposes of the modeling exercise that follows it is assumed that the Arab League region has a 40 percent export share; the EU 25 percent; and the US 7 percent (see Table 1).⁶

Although tariffs have been declining in recent years—the maximum tariff was recently reduced to 50 percent—at around 20 to 25 percent the import weighted average tariff is still relatively high. Tariffs on inputs are often lower than those applied to final goods, leading to effective rates of protection that are often a multiple of nominal rates.⁷ With the exception of

⁵ This section draws on Maskus and Konan (1997) and Hoekman, Konan and Maskus (1998).

⁶ The Arab share is assumed to be higher than for merchandise reflecting the similarity in language, the importance of proximity for service delivery, and the prevailing policy of favoring Arab services-related investment. In earlier work, (Konan and Maskus 1997a; Maskus and Konan 1997) it is assumed that services trade is closely complementary to merchandise trade in terms of its sources so that regional shares of services trade equal each region's share in total merchandise trade. In this paper this assumption is only maintained for export shares of the Suez canal.

⁷ However, if account is taken of the fact that services are heavily protected, average effective rates of protection for manufacturing are much smaller. See Hoekman and Djankov (1997). It is also the case that total tariff revenue

those on imports of textile products, all quantitative restrictions have been abolished, and the textile bans are scheduled to be eliminated in the coming years as part of Egypt's commitments under the Uruguay Round.⁸

As tariffs and quotas have declined in importance, administrative control of the import process has become more prominent and important. Such controls and "red tape" are reflected in customs clearance procedures, in the enforcement of national health and safety standards, and in the logistics involved in moving shipments to, through, and from ports. These controls impose real trade costs on the private sector, both directly in terms of financial charges and indirectly through the opportunity costs of delays incurred in customs clearance (Kheir El Din, 1998). Customs valuation and classification practices are problematic. Assessed values are frequently reported to exceed invoice values, and applied tariffs may be a multiple of the statutory rate.⁹ Invoices are frequently rejected—in the case of one large foreign firm, 200 out of some 600 declarations in 1996 were rejected/contested. The Egyptian system of standards and technical regulation is a major bottleneck for importers. Up to five agencies may independently inspect and test consignments for conformity with Egyptian "quality control" standards. As of 1994 some 1,550 tariff lines (25 percent of the tariff schedule) were subject to such controls.¹⁰ As is the case for tariff rates, many of which escalate sharply, fees for goods that are intended for retail

collections are less than what should be collected if all tariffs were fully applied, reflecting a variety of exemptions, including Arab League preferences, as well as circumvention.

⁸ Kheir el Din and El Sayed (1997).

⁹ The variance in valuation and applied rates can be significant. Data provided by importers in 1995 suggest that assessed values for capital equipment may exceed invoice values by 25 percent or more, while applied tariffs may exceed the applicable statutory rates by an even wider margin. See World Bank, 1995.

¹⁰ Consignments that were rejected in 1993 included fasteners, spare parts for cars; transformers; pressure cookers; filters; brake pads; ceramic tiles, light bulbs; ballpoint pens; washing machines; wheat; fresh fruit; dried fruit; sesame; frozen meat; and frozen fish.

sale were generally at least twice as large as those that applied if further processing occurred in Egypt. Nathan Associates (1996) estimate that the direct and indirect costs of the system of standards and technical product regulations increased costs for traders and producers by between 5 and 90 percent, depending on the industry, with the highest costs for food products and imported final consumer goods.

An absence of competition in key service sectors also imposes excess costs on business. Only Egyptian nationals may import. Fees charged by the public companies providing port services for handling and storage of goods are some 30 percent higher than in neighboring countries or nations with which Egypt competes, while these companies do not provide quality service in return. Maritime shipping is a monopoly of the state-owned Egyptian Maritime Navigation Company. A 1994 survey revealed that the cost of shipment and handling in Egypt of a standard container was 27, 22, and 19 percent higher than in Jordan, Syria and Turkey, respectively (Mohieldin, 1997). Foreign firms seeking to advertise their goods pay a multiple of the rates charged for domestic producers. Low quality and high cost telecommunications impose additional costs on the private sector. The telecommunications provider is an inefficient public monopoly—waiting times for new lines, revenue per line and percentage of completed calls are among the lowest in the Middle East. National and international communications are a multiple of cost, reflecting a policy of cross-subsidizing local calls. The company manufactures telephone sets and small switches itself. Insurance is dominated by three public sector firms which have 85 percent of the general insurance market and over 90 percent of the life insurance market. Foreign ownership is only allowed in free-zones, although the Government committed to allow foreign presence in domestic market through joint ventures by 1999, subject to a maximum equity stake of 49 percent.

No comprehensive estimates exist of the total cost and incidence of the various regulatory barriers that confront Egyptian producers and traders. The standards regime alone has been estimated to have a negative direct impact equivalent to one percent of GDP (Nathan Associates, 1996). Adopting a more competitive regulatory regime for telecommunications would generate a net welfare gain of \$800 million (Galal, 1998), or 1.2 percent of GDP. Indirect effects—e.g., through discouraging investment—will increase total costs further.

A number of initiatives have been taken in recent years to study and reduce red tape costs. Documentary requirements have been simplified, the incidence of stamp duties reduced, and fees for port and related services lowered. The shipping monopoly is in the process of being abolished.¹¹ While these initiatives have improved the situation, much more remains to be done. In principle, implementation of an FTA with the EU could help to achieve a reduction in red tape costs through a process of simplification and abolition of administrative controls and harmonization and mutual recognition of standards. Our analysis below explores this issue further.

4. The Model and Benchmark Data

A competitive, constant returns to scale computable general equilibrium model is used to explore the magnitude of the potential gains from deeper integration. The formal equations and notation of the model are presented in the appendix.¹² Egypt is modeled as a price taker on world markets: policy changes are assumed not to significantly alter prices in other regions of the world.

¹¹ *Financial Times*, September 25, 1997, p. 8.

¹² See Maskus and Konan (1997) for a fuller description of the model.

Constant returns to scale and perfect competition imply that prices equal marginal costs of output. Final outputs are produced according to a Leontief function using intermediate inputs and real value added (Figure 1).¹³ A constant elasticity of substitution (CES) production function describes the substitutability between labor and capital inputs in producing real value-added. Intermediate inputs and final goods are differentiated by country of origin according to the Armington assumption, so that export and import prices differ across regions.¹⁴ In each sector, demand for domestically produced and imported goods is represented by a CES function, and intermediate imports are also differentiated by region of supply in a CES structure. Similarly, Egyptian industries supply regionally differentiated goods to both domestic and foreign markets (exports). Production follows a nested two-stage constant elasticity of transformation (CET) function. Total output is first calculated as the sum of domestic supply and total exports, with the latter then being allocated across regions (EU, US, Arab League, and ROW) according to a sub-CET function.

Capital is assumed to be partially mobile in the sense that there are a number of resource constrained sectors, which we take to be agriculture (VG1, VG2, ANI), mining (OIL, MIN), utilities (ELE), and transport (TRN). In all other sectors capital is freely mobile. The intention underlying this assumption is to capture resource constraints that limit intersectoral factor flows and output changes. In particular, the ability to expand agricultural production is limited by significant water scarcities and there are also constraints on output in crude petroleum and the

¹³ A CES structure for production, assuming a substitution elasticity of 0.5, leads to very similar results.

¹⁴ This assumption may seem inconsistent with the small open economy notion that Egypt is a price taker on world markets. However, this approach is quite standard in the literature, and there is no obvious way to address this issue given the data at hand. De Melo and Robinson (1989) show that models that allow product differentiation are well behaved under a small open economy assumption; in effect the economy is a price taker at the level of aggregate trade flows and each region's aggregation is sufficiently distinctive to support the Armington assumption.

Suez Canal. To address the latter problem, transportation exports are held constant in the counterfactuals.

A representative consumer maximizes a nested CES utility function with a corresponding multi-staged budget constraint. In the first stage, the consumer decides how much to spend on goods from each sector, given the budget constraint. Income elasticities across sectors are set at unity as given by a Cobb-Douglas (CD) utility nest. In the second nest, the consumer determines domestic and aggregate import expenditures in each sector according to a CES function. Then given a budget for imports, the consumer selects purchases of imports from each region. These latter functions also characterize the split between government consumption and investment spending on domestic and imported goods and services. The representative consumer receives income from primary factors (production labor, non-production labor, and capital), net transfers from the government, the current-account deficit, as well as any net economic rents from the operation of nontariff barriers to trade.

Intermediate inputs are disaggregated into domestic sources and imports to incorporate importing costs and tariffs in purchases for the production sector. Sector-specific proportionate import costs (u_i) and export costs (v_i) capture the impact of regulatory barriers, or "red tape". As discussed in Section 2, these have a variety of different dimensions, depending on whether formal bilateral agreements are a precondition for removal on either the import and/or export side, whether they are frictional or rent-creating, and whether removal would be applied on a MFN basis. Insufficient data exists to allow a breakdown of the existing set of NTBs into these categories. Examples of costs that can be removed on a unilateral and nondiscriminatory (MFN) basis include administrative procedures and time-related costs due to inspection delays or monopoly port services. Examples of costs that could require formal bilateral agreements may

include product standards and certification regimes and recognition of national licensing schemes and qualification requirements for professional service providers. In the absence of information on the distribution of deep integration benefits between the EU and the rest of the world, in the simulations we assume that half of any “red tape” cost reduction on goods imports are “bilateral:” that is, elimination is conditional on the negotiation of a MRA and benefits only EU-Egypt trade flows.

Regulatory barriers also vary in their implementation from being frictional to being resource-using and rent seeking. The simulation exercises consider both possibilities. In the case of frictional barriers, we assume that a reduction in import costs shifts “rent revenues” to the consumer (representative agent) in the form of increased purchasing power. In contrast, resource-using barriers impose further costs on society as they employ resources wastefully. That is, they are directly-unproductive and the rents are dissipated. In either case, changes in aggregate consumption are a direct measure of “equivalent variation,” with the cost of living index associated with the utility function chosen as numeraire. We assume frictional costs associated with customs-related “red tape” to equal 5 percent of the value of imports. Removal of these costs will benefit *all* trade on an MFN basis. In addition, we assume rent-creating costs of 10 percent, associated with the “quality standards” regime. We regard these as rent-creating because most of the standards-related controls are applied to goods that in the past were subject to QRs and import bans. Recognizing that some of these standards may require a MRA in order to be abolished, we assume further that only 50 percent of these standards-related import barriers can be eliminated on an MFN basis.

MRA-type of agreements concluded in the context of an FTA with the EU should also result in improved market access opportunities as Egyptian goods no longer are subject to

inspection costs and associated uncertainty upon entry into the EU. We assume that these costs are equivalent to a five percent import “tax” on food and agricultural produce (given reports that sanitary and phyto-sanitary measures have been used by the EU to block imports—see World Bank, 1995), a two percent barrier on textiles, and a conservative one percent tariff equivalent for other goods. We also impose a frictional export “tax” on Egyptian producers of 2 percent, to reflect the existence of fees and red tape costs that have been documented in surveys of the private sector (World Bank, 1995).

One of the impacts of deeper integration with the EU will potentially be greater competition in service markets by Egyptian firms, foreign suppliers, and foreign direct investment. To appropriately model the service sector would require information on the nature of present market imperfections and the potential form that an open market might take. We approximate the current environment with a conservative 15 percent across the board markup on service production.¹⁵ In addition, cost-raising regulatory barriers equivalent to a 100 percent markup on international telecommunications and a 30 percent markup on international transport are imposed. These apply to exports and imports of goods and services, with the incidence of the additional “tax” across sectors depending on the intensity of the use of these service inputs, as revealed by the input-output table. Also, we apply a 100 percent markup on distribution services to reflect the fact that entry into this activity is prohibited to foreign nationals. Finally, there are barriers on European imports of Egyptian services. We assume a relatively modest 50 percent tariff equivalent on exports of construction, professional and personal services (CON, HSG,

¹⁵ Comprehensive estimates of the cost-raising effects of regulatory regimes that restrict competition in service markets are lacking. However, many case studies of individual sectors suggest that excess costs are more than 15 percent. See Section 2 above, World Bank (1995) and the contributions in Galal and Hoekman (1997) for a discussion.

REC, PER). Removal of these service export barriers is assumed to require a MRA (i.e., the liberalization is discriminatory). However, liberalization of Egyptian service barriers is assumed to be applied strictly on a MFN basis. Throughout the counterfactuals, service trade barriers are rent creating, where the rents generated are collected by the representative agent.

Two standard closure rules are imposed: the savings-investment balance (equation A12) and a fixed current account balance (equation A14). The savings-investment balance is based on the assumption that the capital stock is exogenously fixed at the benchmark level. This stock is financed through forced consumer savings that acts as a direct (lump-sum) tax. A capital good is modeled as composite goods of fixed composition. Firms buy composite capital according to their preferences. The interest rate (an index price of the composite capital stock) is endogenous and determined by factor demand conditions.¹⁶ The current-account imbalance is held constant at its benchmark level throughout the simulations. Foreign currencies are scaled so that the appropriate GDP deflator ("world" price index) is one. Given the small-economy assumption, the world price index is held constant throughout the analysis. Because the benchmark current account is in deficit, it represents an addition to the representative agent's income through exogenous capital inflows, as noted in equation (A12). To hold B fixed while international prices are constant requires a balancing item in equation (A14). This is accomplished by means of a change in the home "real exchange rate," which refers implicitly to a change in the home price index (generated by changes in price of home-produced goods) sufficient to sustain a constant current-account deficit measured

¹⁶ No distinction is made between domestic capital and capital inflows from foreign direct investment (FDI). The impact of trade liberalization on the volume of FDI is generally ambiguous. Tariff reduction will lower the incentive of foreign firms to service Egyptian markets with "tariff jumping" FDI. In contrast, lower tariffs on intermediate imports may encourage export-oriented FDI. These issues are beyond the scope of the present analysis. See Brown, Deardorff and Stern (1997) for an exploration of the issue in the context of the EU-Tunisia agreement.

at world prices.¹⁷ Thus, B is held fixed, along with the price terms, requiring e to change as import and export volumes change.

The government budget deficit is a deduction in available income for the representative agent, constituting a transfer to government consumption. The deficit is held fixed during our simulations. Thus, if a policy reform causes prices to fall, thereby reducing the tax revenues required to finance government expenditures, this tax saving is transferred to the representative agent. At the same time, if trade liberalization results in lost tariff revenues, the revenues are recouped by means of allowing GST tax rates, τ_{Ci} , to vary. The GST is applied on sales of goods and services at rates ranging from zero to 25. The standard tax rate is 10 percent (see Table 2 for benchmark GST rates).¹⁸ Taxes paid by firms on their intermediate input purchases are recoverable through a tax credit, with the exception of purchases of investment goods and some service inputs. Absent sufficient information on these tax credit exceptions, we choose to model the tax as a levy solely on final goods purchases, assuming that taxes on all inputs are credited back to purchasing firms.

The data for the model consist of a Social Accounting Matrix (SAM) and other parameters, such as elasticities of substitution and transformation,¹⁹ import and export trade flows by region,

¹⁷ A rise in the “real exchange rate” is consistent with a depreciation of home currency, in that the per-unit price of foreign exchange rises.

¹⁸ Tax rates on capital are held constant. Effective corporate tax rates calculated for 1990 are reported in Table 2. Legislated corporate tax rates are considerably higher than these effective rates, which reflect tax holidays, depreciation schedules, and various exemptions. Available information indicates that there is no tax on agriculture, approximately a 23% effective tax on services, and approximately an 18% tax on manufactures, which we apply also to the mining and crude oil sectors. These rates have been incorporated into the 1990 SAM to calibrate the benchmark economy.

¹⁹ As there is also little empirical evidence on Egyptian elasticities, labor-capital substitution is allowed to vary across industries, using estimates from Harrison, Jones, Kimbell and Wigle (1992). Labor-labor substitution is set at a conservative 0.50 (see Table 2). Benchmark trade elasticities are drawn from Rutherford, Rutstrom and Tarr (1993). The various trade elasticities are 2.0 for substitution between domestic and imported goods, 5.0 for substitution among regional imports and for transformation between domestic output and exports, and 8.0 for transformation among

and tax and tariff rates. These data are assembled into a consistent set of relationships between intermediate demand, final demand, and value-added transactions using the 1989/1990 input-output table for Egypt, updated to incorporate trade and tax policies and trade shares as of 1994.²⁰ Trade and tariff data by 8-digit HS line were aggregated to the input-output sectoral basis using import weights consistent with the concordance between the input-output table and the tariff classification. From these data, regional trade shares for 1994 were applied to 1990 trade volumes on the input-output basis. Egypt does not realize the full revenue that would obtain if statutory tariff rates were applied to all imports because of various exemptions for duty-drawback provisions and investment incentives. Thus weighted legal tariff rates were scaled downward (by some 20 percent) to ensure consistency with total import duty collections in 1994. To take into account the existence of the quantitative restrictions on imports of textiles and clothing, the statutory MFN rates for this sector have been doubled.

5. Preferential Trade Liberalization: Simulations and Results

Various preferential trade-liberalization scenarios for Egypt are analyzed with the model, involving different combinations of FTAs with the EU and the Arab region. The first, Table 3 Column (1), is a shallow partnership agreement with the European Union in which Egypt preferentially removes all tariffs on EU goods but does not liberalize non-tariff barriers or service barriers.²¹ The second

regional export destinations. These parameters are consistent with the ranges of elasticities reported in Lofgren (1994). Results of sensitivity analysis with respect to the various trade elasticities are reported in Maskus and Konan (1997).

²⁰ See Maskus and Konan (1997) for a detailed discussion of the updating procedure, which involved re-calibrating the model on the basis of the 1994 policy parameters.

²¹ Throughout the counterfactual simulations the beverage tariff is not changed to reflect Egypt's social policy for maintaining rigorous barriers on imported alcoholic beverages. Similarly, tariffs on tobacco products are held fixed

allows for deep integration and assumes a limited agreement is reached that will result in liberalization of Egyptian import and export regulatory barriers on a MFN basis (Columns (2) and (4)). No additional market access gains are likely in the EU: agricultural markets remain protected and Egypt already enjoys duty-free access to EU markets for manufactures.

Another possibility for deep integration is that negotiations will also remove ‘standards-related’ costs on a discriminatory basis through formal mutual recognition-type agreements (MRA) with the EU. The MRA scenarios (Columns (3) and (5)) combine MFN liberalization of nondiscriminatory barriers and removal of standards NTBs on imports from the EU (so that standards liberalization does not extend to the rest of the world). Moreover, the EU responds by providing somewhat improved access to its markets. This is assumed to be equivalent to a one percent increase in export price for all commodities except agriculture and textiles/clothing, where a five and two percent terms of trade improvement occurs, respectively. These improvements are assumed to reflect the removal by the EU of frictional customs clearance- and standards-related costs.

We also distinguish between an agreement limited strictly to agriculture and manufacturing trade (Columns (1) to (3)) and one extending to the service sector (Columns (4) and (5)). As discussed above, all service barriers are assumed to be rent-generating, Egyptian barriers are applied on a MFN basis, and the “MRAs” have the potential to remove European barriers to exports of Egyptian services such as construction, professional, and personal services.

Finally, we analyze the impact of an EU agreement against the backdrop of the FTA with the Arab League nations that was agreed in 1997 (Table 4). The Arab League agreement is a

in order to reflect the fact that governments in the region will continue to impose high excises on these products for revenue and health purposes.

“classic” FTA under which only tariffs are removed. As the Arab region is both a major destination of Egyptian exports and tariff levels in the region are significantly higher than those that are applied in the EU and US markets, in principle liberalization of Arab trade barriers can have a major impact on Egyptian welfare. We compute the applied tariff rates in the benchmark case as a function of actual trade weights (the Arab region’s terms of trade adjust as a percentage of the weighted average tariff rates), reported in Table 2.²²

Table 3 reports results for Egypt-EU FTA scenarios. If the agreement is restricted to a shallow FTA with no improved access to EU markets, trade diversion generates an estimated welfare loss of 0.14 percent is generated over benchmark 1994 levels. The real exchange rate (ERATE) or shadow price of foreign currency increases by 1.2 percent in order to maintain the benchmark current account deficit. The goods and services tax (GST) falls by about 4.5 percent. As the reformed tariffs become more efficient tax collection tools, the GST can be lowered, implying a gain in welfare for the representative agent. Despite a decrease in tariff collections, government budget neutrality implies a *reduction* in the GST as resources and consumption flow into highly domestically-taxed sectors in response to the fall in tariffs.²³ Real returns to both factors, production and non-production labor (PLWAGE and NLWAGE) increase by more than 2 percent, reflecting enhanced efficiency in the economy. Interest rates are also driven up a percent reflecting an enhanced demand for capital. Trade becomes more focused on the EU, with

²² Data for Jordan’s and Lebanon’s tariffs were compiled from Hoekman and Djankov (1997); Morocco’s and Tunisia’s tariffs were obtained from Rutherford et al. (1993, 1995). A concordance consistent with the Egyptian IO table was developed to map tariffs into the 38 sectors of the model. Tariffs were weighted by 1996 import shares, using the UN COMTRADE data base.

²³ That government revenues may increase in response to a piecemeal tariff reform is discussed in Konan and Maskus (1997b).

import quantities increasing by over thirty percent with the EU and falling with the rest of the world.

Deep integration scenarios have a substantially larger impact in terms of welfare, ranging from four percent to over thirty percent of real GDP, depending on whether services are liberated. All deep integration scenarios involve elimination of nondiscriminatory trade costs. Whether an MRA is reached to eliminate EU standards-related costs is important especially if services are involved. In the case of liberalization of trade in goods only, elimination of frictional barriers (5 percent tariff equivalent for red tape and 5 percent due to standards-related costs) on an MFN basis generates substantial economic gains estimated at 4 percent of real GDP, Table 3 Column (2). These gains are fairly evenly spread across society as labor income grows by over 5 percent and returns to capital increase by about 4 percent. Reaching a deeper MRA-type agreement that eliminates the remaining five percent Egyptian standards-related barrier, as well as EU barriers to Egyptian exports on a discriminatory, bilateral basis would magnify these effects: welfare improves over benchmark 1994 levels by an estimated 5.6 percent. Imports from the EU increase by nearly two-thirds and fall with other trading partners.

According to our estimations, service liberalization has the potential to substantially improve the Egyptian economy with welfare gains ranging from 13 percent from MFN Egyptian liberalization of the service sector to twenty percent if, additionally, an MRA is reached that improves access to European service markets. In the former case (MFN, Column (4)) service liberalization substantially increases Egypt's export position especially with the Middle East - North Africa region where export quantities triple. In the service liberalization - MRA scenario (Column (5)), welfare gains are largely driven by the improvements in Egyptian access to European service markets, discussed above, which we model as a fifty percent increase in the

European price of construction, personal and professional services. This improvement in European access diverts Egyptian exports from other regions, including MENA, as trade focuses on the EU. Trade is substantially redirected toward the EU with EU imports more than doubling and exports increasing by thirty percent in quantity terms.

Adding a FTA between Egypt and the members of the Arab League results in larger welfare gains for Egypt, even if there is no deep integration associated with the EU FTA (0.78 percent instead of -0.14 percent) (Table 4). This is not surprising given that intra-Arab trade barriers are much higher than those applying to Egypt's exports to the EU. The Arab League FTA could give rise to large increases in intra-regional trade with exports to the Arab region rising by 7 hundred million US dollars, while the value of imports from the region rise by 87 million US dollars relative to the 1994 benchmark. Implementation of the Arab FTA results in large reductions in exports to the EU and the US, as Egyptian producers reorient their goods to the region. The Arab FTA increases the payoff to deep integration with the EU as well—depending on assumptions regarding MFN vs. MRA, welfare could rise by up to 7 percent of GDP. These are quite high numbers for the type of static, competitive model that is used, and largely reflect the high MFN tariff levels that apply in the Arab region.

6. Conclusions

Given Egypt's highly diversified trading patterns, a shallow PTA with the EU has the potential to be merely diversionary and lead to a small welfare decline. Reflecting the fact that Egypt already has duty-free access to the EU for manufactures—the loss in tariff revenues that will be incurred outweighs any trade creation that will result. Large welfare gains from a EU FTA are conditional upon the elimination of regulatory barriers and red tape. If deep integration efforts are pursued

that deliver such an improvement in the business environment, the welfare gains may be substantial, from 4 percent to upwards of 20 percent growth in real GNP. The variance in these impact results indicates that it is important to have a good sense of how large the regulatory costs are, whether elimination of regulatory barriers can be applied on a nondiscriminatory basis, and whether the barriers create rents or are largely frictional in nature. In the case of Egypt, a case can be made that frictional costs are likely to be large, to represent a major share of the total costs imposed by the regulatory regime, and not to require MRA-type formal agreements as a condition of their abolition. But the fact remains that we do not have reliable information on any of these key parameters.

Our results suggest that the additional impact of services liberalization may be significant. Improvements in service efficiency lead not only to a gain in domestic welfare and output but also to an improved export position, especially with MENA. The potential welfare gains to better access to European service markets may be quite substantial. Given low trade barriers in the EU and the relatively high tariffs maintained by Egypt and other Arab countries, it is not surprising that there are potentially large gains associated with intra-Arab trade liberalization. Here again much depends on the availability of accurate information on the actual trade policies of the Arab countries vis a vis each other. These are difficult to come by. To the best of our knowledge, no comparable cross-country empirical analyses have been undertaken to estimate what the tariff equivalents are of the various regulation-related trade costs that currently exist in the Arab region more generally. Without such empirical work—which should span both product and service markets—computational work of the kind attempted in this paper will necessarily be subject to large margins of error.

That being said, it is important that not too much be made of the weakness of the datasets that are available. The major points that emerge from the analysis are fully consistent with the policy prescriptions that emerge from economic theory and analytical models. PTAs that are limited to the elimination of tariffs for merchandise trade flows are of limited value at best. Such PTAs may as easily be welfare reducing as welfare enhancing. It is important that PTAs go beyond elimination of tariffs and quotas to include regulatory and red tape costs, as well as efforts to open service markets to foreign competition. Both policymakers and analysts must take into account that some types of “red tape” stemming from the enforcement of regulatory regimes cannot be eliminated on an MFN basis. To the extent that this is the case, account must be taken of the need to negotiate MRAs and equivalent instruments. These may give rise to large gains, but should be pursued on a MFN basis, i.e., in the WTO context.

REFERENCES

- Baldwin, Richard. 1995. *Towards an Integrated Europe*. London: CEPR.
- Brown, Druscilla, Alan Deardorff and Robert Stern. 1997. "Some Economic Effects of the Free Trade Agreement between Tunisia and the European Union," in Galal and Hoekman.
- De Melo, Jaime and Sherman Robinson. 1989. "Product Differentiation and the Treatment of Foreign Trade in Computable General Equilibrium Models of Small Economies," *Journal of International Economics*, 27:47-67.
- European Commission. 1996. "Economic Evaluation of the Internal Market," *European Economy*, Reports and Studies No. 4.
- Galal, Ahmed. 1998. "Towards a More Efficient Telecommunications Services in Egypt," Policy Viewpoint No. 2, January. Egyptian Center for Economic Studies, Cairo.
- Galal, Ahmed and Bernard Hoekman. Editors. 1997. *Regional Partners in Global Markets: Limits and Possibilities of the Euro-Med Agreements*. London: CEPR.
- Harrison, G.W., R. Jones, L. Kimbell Jr., and R. Wigle. 1992. "How Robust is Applied General Equilibrium Modeling?" *Journal of Policy Modeling*, v. 15.
- Hoekman, Bernard and Simeon Djankov. 1997. "Effective Protection and Investment Incentives in Egypt and Jordan: Implications of Free Trade With Europe," *World Development*, 25: 281-91.
- Hoekman, Bernard, Denise Eby Konan and Keith Maskus. 1998. "An Egypt-US Free Trade Agreement: Economic Incentives and Effects," in A. Galal and R. Lawrence (eds.), *Building Bridges: An Egypt-U.S. Free Trade Agreement*. Washington DC: Brookings Institution.
- Kheir El Din, Hana'a. 1998. "Enforcement of Product Standards as a Barrier to Trade," Cairo University, mimeo.
- Kheir-el-Din, Hana'a and Hoda El-Sayed. 1997. "Potential Impact of a FTA with the EU on Egypt's Textile Industry," in Galal and Hoekman.
- Konan, Denise Eby and Keith E. Maskus. 1997a. "A Computable General Equilibrium Analysis of Egyptian Trade Liberalization Scenarios," in Galal and Hoekman.
- Konan, Denise Eby and Keith E. Maskus. 1997b. "Joint Trade Liberalization and Tax Reform in a Small Open Economy: The Case of Egypt," manuscript, University of Colorado.
- Konan, Denise Eby and Keith E. Maskus. 1997c. "Is Small Beautiful? Trade Shares and Trade Creation with Differentiated Products," manuscript, University of Hawaii.

- Lawrence, Robert and others. 1995. *Towards Free Trade in the Middle East: The Triad and Beyond*. Cambridge: Harvard University (June).
- Lofgren, Hans. 1994. "Elasticity Survey," International Food Policy Research Institute, Washington DC, mimeo.
- Maskus, Keith E. and Denise Eby Konan. 1997. "Trade Liberalization in Egypt," *Review of Development Economics*, 1:275-93.
- Messerlin, P. 1998. "Technical Regulations and Standards in the EU," World Bank, mimeo.
- Mohieldin, Mahmoud. 1997. "The Egypt-EU Partnership Agreement and Liberalization of Services," in Galal and Hoekman.
- Nathan Associates. 1996. "Research Study of the Quality Control System in Egypt," July.
- Robinson, Sherman and C. Gehlhar. 1995. "Land, Water, and Agriculture in Egypt: the Economy-wide Impact of Policy Reform," International Food Policy Research Institute, manuscript.
- Robson, Peter. 1998. *The Economics of International Integration*. Routledge, London.
- Rutherford, Thomas. 1989. "General Equilibrium Modeling with MPS/GE," Department of Economics, University of Western Ontario.
- Rutherford, T., E.E. Rutstrom, and D. Tarr. 1993. "Morocco's Free Trade Agreement with the European Community," Policy Research Working Paper 1173, The World Bank, September.
- Rutherford, T., E.E. Rutstrom, and David Tarr. 1995. "The Free Trade Agreement Between Tunisia and the European Union," World Bank, mimeo.
- Schiff, Maurice. 1997. "Small Is Beautiful: Preferential Trade Agreements and the Impact of Country Size, Market Share, and Smuggling". *Journal of Economic Integration* 12:359-87.
- Unter, Brian. 1998. "Maximizing Custom Benefits—A Global Model for Regulatory Reform," presented at the US-China Standards, Testing and Certification Workshop, Washington DC, February 17-18.
- Wilson, John. 1998. Product Standards and International Trade. World Bank, mimeo.
- World Bank. 1995. "Egypt: Into the Next Century: Volume I, Macroeconomic Framework," manuscript.
- Yeats, Alexander. 1996. "Export Prospects of Middle Eastern Countries" Policy Research Working Paper 1571, World Bank.

TABLE 1: BENCHMARK OUTPUT AND TRADE SHARES

SECTOR	Output*	Import#				Export#			
	(1)	Total (2)	EU@ (3)	US (4)	MENA ¹ (5)	Total (6)	EU@ (7)	US (8)	MENA ¹ (9)
AGRICULTURE									
1. Vegetable products, foodstuffs (VG1)	12.4	13.3	11.7	47.9	2.2	2.6	27.0	1.5	63.5
2. Vegetable products, non-foodstuffs (VG2)	1.7	0.0	36.9	16.5	1.2	0.1	49.3	13.4	14.1
3. Animal products (ANI)	8.0	0.8	82.7	0.0	9.6	0.3	35.2	2.3	53.0
MINING AND QUARRYING									
4. Crude petroleum and natural gas (OIL)	2.7	1.2	52.0	7.0	24.4	18.5	30.6	4.6	1.0
5. Other extractive industries (MIN)	.09	2.0	17.7	14.8	3.5	0.2	56.8	9.2	21.4
MANUFACTURING									
6. Food processing (FOO)	7.7	15.1	40.3	10.6	2.3	1.3	20.1	4.5	49.3
7. Beverages (BEV)	0.6	0.0	41.7	16.3	28.5	0.0	1.2	0.0	87.6
8. Tobacco products (TOB)	1.9	1.0	27.0	27.4	2.5	0.0	0.4	0.7	45.3
9. Cotton ginning and pressing (TX1)	1.2	0.5	36.9	0.3	0.9	4.2	33.7	0.2	1.4
10. Cotton spinning and weaving (TX2)	5.2	2.4	33.4	7.1	3.7	10.3	72.4	10.9	6.1
11. Clothing: assembled and pieces (CLO)	1.4	0.0	12.4	0.9	19.1	1.2	34.7	49.1	8.6
12. Leather products, excl. shoes (LEA)	0.2	0.0	25.7	0.9	13.8	0.1	48.8	1.5	30.9
13. Shoes (SHO)	0.4	0.0	16.0	2.9	12.0	0.0	20.5	1.9	60.5
14. Wood products, excl. furniture (WOO)	1.1	5.0	39.8	1.4	0.4	0.1	1.5	0.1	86.1
15. Furniture (FUR)	1.4	0.0	57.0	34.7	1.4	0.5	14.9	10.6	58.5
16. Paper and printing (PAP)	1.5	3.3	46.8	17.1	2.9	0.9	1.6	0.8	91.7
17. Chemicals, excl petro. (CHE)	3.1	10.8	62.6	12.2	7.9	1.8	31.3	3.5	39.4
18. Petroleum refining (PET)	2.7	1.2	48.4	6.2	28.9	3.3	58.5	0.6	7.2
19. Rubber, plastics and products (RPL)	0.8	2.3	42.8	20.4	9.8	0.3	41.3	0.7	45.3
20. Porcelain, china, pottery (POR)	0.3	0.4	47.4	7.8	11.5	0.1	42.2	1.5	32.4
21. Glass and products (GLA)	0.3	0.5	63.3	5.3	3.6	0.1	9.3	5.5	62.1
22. Mineral products, n.e.i. (MPD)	1.7	0.4	61.6	3.8	2.2	0.0	4.8	2.0	80.9
23. Iron, steel, other base metals (MET)	2.8	2.6	35.5	11.8	9.0	0.8	68.3	1.9	24.3
24. Machinery and appliances (MAC)	3.5	23.1	59.4	17.4	2.4	4.6	9.5	3.9	58.0
25. Transportation equipment (TRA)	1.0	5.9	33.8	12.1	0.7	0.4	3.6	0.3	89.8
26. Other manufacturing (OMF)	0.1	0.5	47.6	11.2	3.5	0.1	25.4	3.2	62.5

TABLE 1: BENCHMARK OUTPUT AND TRADE SHARES (Continued)

SECTOR	Output*	Import [#]				Export [#]			
	(1)	Total (2)	EU@ (3)	US (4)	MENA [!] (5)	Total (6)	EU@ (7)	US (8)	MENA [!] (9)
SERVICES AND OTHER									
27. Electricity, gas, and water (ELE)	1.7	0.2	44.6	16.8	4.3	0.7	25.0	7.0	40.0
28. Construction (CON)	5.5	0.2	44.6	16.8	4.3	0.8	25.0	7.0	40.0
29. Trade (TRD)	7.1	0.3	44.6	16.8	4.3	5.6	25.0	7.0	40.0
30. Restaurants, hotels, coffeehouses (RES)	2.3	0.0	44.6	16.8	4.3	5.0	25.0	7.0	40.0
31. Transport and storage (TRN)	6.0	1.3	44.6	16.8	4.3	31.9	44.7	6.7	20.2
32. Communications (COM)	0.8	0.1	44.6	16.8	4.3	0.4	25.0	7.0	40.0
33. Financial establishments (FIN)	1.5	1.1	44.6	16.8	4.3	0.0	25.0	7.0	40.0
34. Insurance (INS)	0.3	0.0	44.6	16.8	4.3	0.5	25.0	7.0	40.0
35. Real estate, housing services (HSG)	2.8	3.9	44.6	16.8	4.3	0.0	25.0	7.0	40.0
36. Social and community services (SER)	6.0	0.1	44.6	16.8	4.3	0.2	25.0	7.0	40.0
37. Recreational and cultural services (REC)	0.5	0.2	44.6	16.8	4.3	3.2	25.0	7.0	40.0
38. Personal services (PER)	0.9	0.0	44.6	16.8	4.3	0.0	25.0	7.0	40.0

Notes: @ Including Turkey; ! Excluding Israel.

Source: Modified from Konan and Maskus 1997.

TABLE 2: Government Policy and Elasticity Parameters (%)

SECTOR	GST-94*	K Tax-94	Egypt Tariff, 1994	MENA Tariff	ESUB _{KL}
	(2)	(3)	(4)	(5)	(6)
AGRICULTURE					
1. Vegetable products, foodstuffs (VG1)	0.0	0.0	2.5	6.3	0.95
2. Vegetable products, non-foodstuffs (VG2)	10.0	0.0	6.7	28.9	0.95
3. Animal products (ANI)	0.0	0.0	4.4	6.7	0.95
MINING AND QUARRYING					
4. Crude petroleum and natural gas (OIL)	0.0	18.0	8.2	2.9	0.43
5. Other extractive industries (MIN)	10.0	18.0	7.0	15.6	0.43
MANUFACTURING					
6. Food processing (FOO)	0.0	18.0	6.8	18.3	0.95
7. Beverages (BEV)	10.0	18.0	953.2	14.8	0.95
8. Tobacco products (TOB)	10.0	18.0	65.5	83.1	0.95
9. Cotton ginning and pressing (TX1)	10.0	18.0	17.3	24.9	0.93
10. Cotton spinning and weaving (TX2)	10.0	18.0	23.3	17.4	0.93
11. Clothing: assembled and pieces (CLO)	10.0	18.0	53.7	32.5	1.19
12. Leather products, excl. shoes (LEA)	10.0	18.0	34.8	44.6	0.75
13. Shoes (SHO)	10.0	18.0	51.8	36.9	0.75
14. Wood, excl. furniture (WOO)	5.0	18.0	8.1	28.1	0.93
15. Furniture (FUR)	10.0	18.0	46.9	34.9	0.93
16. Paper and printing (PAP)	0.0	18.0	13.3	18.6	1.00
17. Chemical, excl petroleum (CHE)	5.0	18.0	8.9	17.6	1.01
18. Petroleum refining (PET)	0.0	18.0	7.1	20.0	0.43
19. Rubber, plastics and products (RPL)	10.0	18.0	15.6	24.7	0.97
20. Porcelain, china, pottery (POR)	10.0	18.0	43.5	21.3	0.93
21. Glass and products (GLA)	10.0	18.0	29.6	17.2	0.97
22. Mineral products, n.e.i. (MPD)	5.0	18.0	18.1	12.7	0.43
23. Iron, steel, other base metals (MET)	10.0	18.0	17.2	32.6	0.43
24. Machinery and appliances (MAC)	25.0	18.0	17.9	19.9	1.20
25. Transportation equipment (TRA)	25.0	18.0	41.2	56.6	1.88
26. Other manufacturing (OMF)	10.0	18.0	19.3	24.9	1.19
SERVICES AND OTHER					
27. Electricity, gas, and water (ELE)	2.5	23.0	0.0	0.0	1.88
28. Construction (CON)	10.0	23.0	0.0	0.0	1.99
29. Trade (TRD)	8.0	23.0	0.0	0.0	1.28
30. Restaurants, hotels, coffeehouses (RES)	8.0	23.0	0.0	0.0	1.99
31. Transport and storage (TRN)	0.0	23.0	0.0	0.0	1.88
32. Communications (COM)	5.0	23.0	0.0	0.0	1.99
33. Financial establishments (FIN)	8.0	23.0	0.0	0.0	1.99
34. Insurance (INS)	0.0	23.0	0.0	0.0	1.99
35. Real estate and housing services (HSG)	8.0	23.0	0.0	0.0	1.99
36. Social and community services (SER)	10.0	23.0	0.0	0.0	1.99
37. Recreational and cultural services (REC)	8.0	23.0	0.0	0.0	1.99
38. Personal services (PER)	10.0	23.0	0.0	0.0	1.99

* Adjusted to be consistent with the real value of the 1990 government deficit. MENA tariff is trade weighted.

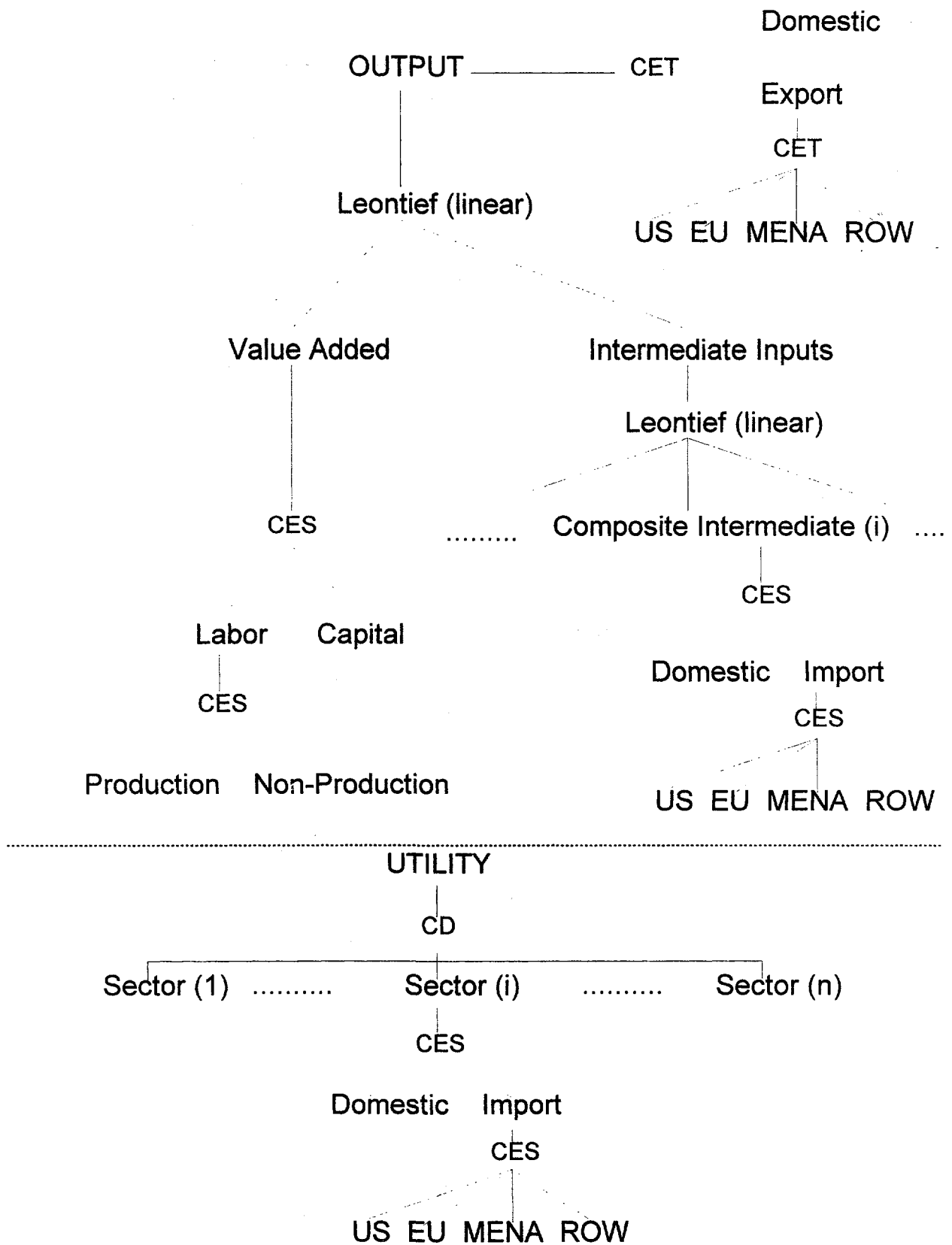
Source: Based on World Bank data and author's calculations.

Table 3: Impacts of Egyptian-EU Trade Agreement

	Shallow Integration; No reduction in regulatory costs	Deep Integration: Service costs fixed		Deep Integration: Service costs also removed	
		MFN only: 5% red tape; 5% standards	MFN + MRA: (3) + 5% cut in standards costs; increase in export prices in EU markets	MFN: = (2) + elimination of 15% services cost markup & service-specific trade barriers	MFN+MRA: (4) + EU gives access to Egyptian service exports
	(1)	(2)	(3)	(4)	(5)
<i>Macroeconomic Variables (% change)</i>					
Welfare (EV)	-0.138	4.151	5.626	13.457	20.637
Exchange Rate	1.222	3.425	3.422	4.137	-11.852
Goods and Service Tax	4.484	2.326	3.912	0.908	28.883
Average Tariff	4.676	4.509	3.901	4.462	3.822
Tariff Revenue	-1.627	-1.550	-1.658	-1.495	-1.369
Production Wage	2.022	5.143	5.925	13.458	30.117
Non-production Wage	3.202	6.726	7.085	12.229	36.970
Interest Rate	0.979	4.095	5.064	8.020	13.566
Trade Creation (US\$bn)	0.095	0.126	0.166	0.136	0.490
Trade Diversion US\$bn	0.123	0.100	0.132	0.083	0.045
<i>Export Value Share</i>					
EU	0.306	0.305	0.320	0.156	0.451
US	0.050	0.049	0.047	0.029	0.023
MENA	0.350	0.353	0.358	0.650	0.332
<i>Import Value Share</i>					
EU	0.542	0.544	0.589	0.537	0.575
US	0.149	0.150	0.137	0.154	0.145
MENA	0.032	0.032	0.028	0.032	0.029
<i>Export Value (change US\$ billion)</i>					
EU	0.056	0.083	0.225	0.095	0.372
US	0.011	0.015	0.014	0.048	-0.117
MENA	0.081	0.129	0.238	4.176	-0.201
<i>Import Value (change US\$ billion)</i>					
EU	0.933	1.350	1.906	1.536	3.378
US	-0.186	-0.057	-0.118	0.044	0.374
MENA	-0.047	-0.023	-0.044	-0.009	0.043
<i>Export Quantity (% change)</i>					
EU	4.520	6.769	18.222	7.686	30.156
US	5.676	7.568	7.158	24.224	-59.046
MENA	5.805	9.211	17.026	298.903	-14.406
<i>Import Quantity (% change)</i>					
EU	31.360	45.356	64.036	51.605	181.188
US	-13.905	-4.291	-8.801	3.288	76.751
MENA	-16.169	-7.962	-14.873	-2.918	57.332

Table 4: Impacts of Egyptian - EU Trade Agreement with an Arab League FTA

	Shallow Integration (All regulatory costs kept fixed)	Deep Integration (service costs fixed)		Deep Integration (service costs removed)	
		MFN	MRA	MFN	MRA
	(1)	(2)	(3)	(4)	(5)
<i>Macroeconomic Variables (% change)</i>					
Welfare (EV)	0.781	5.305	7.151	16.705	21.128
Exchange Rate	0.714	2.460	0.541	-3.891	-11.874
Goods and Service Tax	-0.783	-6.810	-6.199	-14.971	26.834
Average Tariff	4.388	4.349	3.871	4.040	3.484
Tariff Revenue	-1.647	-1.506	-1.539	-1.431	-1.467
Production Wage	3.064	7.825	11.571	33.577	31.561
Non-production Wage	-0.447	1.076	1.572	-0.502	34.295
Interest Rate	3.905	8.561	11.093	19.157	15.101
Trade Creation (US\$bn)	0.261	0.455	0.660	0.234	0.477
Trade Diversion (US\$bn)	0.100	0.057	0.067	0.035	0.046
<i>Export Value Share</i>					
EU	0.254	0.231	0.217	0.185	0.415
US	0.039	0.035	0.029	0.028	0.021
MENA	0.461	0.510	0.557	0.565	0.376
<i>Import Value Share</i>					
EU	0.534	0.539	0.589	0.527	0.565
US	0.146	0.144	0.130	0.151	0.143
MENA	0.048	0.049	0.043	0.052	0.044
<i>Export Value (change US\$ billion)</i>					
EU	-0.081	-0.133	-0.184	-0.566	0.239
US	-0.020	-0.033	-0.060	-0.096	-0.122
MENA	0.705	1.045	1.310	0.646	-0.045
<i>Import Value (change US\$ billion)</i>					
EU	1.025	1.611	2.485	2.192	3.340
US	-0.168	-0.021	-0.041	0.243	0.375
MENA	0.087	0.146	0.122	0.240	0.226
<i>Export Quantity (% change)</i>					
EU	-6.586	-10.814	-14.893	-45.920	19.426
US	-9.990	-16.879	-30.437	-48.540	-61.686
MENA	50.452	74.789	93.757	46.243	-3.253
<i>Import Quantity (% change)</i>					
EU	34.451	54.109	83.485	73.650	112.229
US	-12.573	-1.553	-3.060	18.169	27.989
MENA	29.533	49.779	41.584	82.010	77.202



MODEL EQUATIONS AND NOTATION

A. Production

1. Labor Aggregator $L_i = [b_{1i}L_{1i}(\sigma_L-1)/\sigma_L + b_{2i}L_{2i}(\sigma_L-1)/\sigma_L] \sigma_L/(\sigma_L-1)$
2. Value Added Function $V_i = [a_{Li}L_i(\sigma_i-1)/\sigma_i + a_{Ki}K_i(\sigma_i-1)/\sigma_i] \sigma_i/(\sigma_i-1)$
3. Imported Intermediates $M_{iN} = [\sum_r \delta_{ri} m_{riN}(\eta_i-1)/\eta_i] \eta_i/(\eta_i-1)$
4. Composite Intermediate $z_{ji} = [\gamma_{di} d_{ji}(\eta_j-1)/\eta_j + \gamma_{mi} m_{ji}(\eta_j-1)/\eta_j] \eta_j/(\eta_j-1)$
5. Final Goods Technology $Y_i = \min[z_{1i}/a_{1i}, \dots, z_{ni}/a_{ni}, V_i/a_{VA}]$
6. Domestic & Foreign Sales $Y_i = [\alpha_{Di} D_i(\epsilon_i-1)/\epsilon_i + \alpha_{Xi} X_i(\epsilon_i-1)/\epsilon_i] \epsilon_i/(\epsilon_i-1)$
7. Export Allocation $X_i = [\sum_r \beta_{ri} X_{ri}(\epsilon_i-1)/\epsilon_i] \epsilon_i/(\epsilon_i-1)$
8. Marginal Cost Condition $c_i Y_i = \sum_j (1+v_j) p_j d_{ji} + \sum_j \sum_r (1+u_j+t_{rj}) p_{rj}^m m_{rji} + \sum_i (1+\tau_{Ki}) w_K K_i + w_L L_{1i}$

B. Utility

9. Utility Function $U = \Pi_i C_i^{\lambda_i}; \sum_i \lambda_i = 1$
10. Domestic & Import Consumption (applies also to G_i and I_i^F) $C_i = [\phi_{Di} D_i C(\psi_i-1)/\psi_i + \phi_{MiC} M_{iC}(\psi_i-1)/\psi_i] \psi_i/(\psi_i-1)$
11. Import Allocation (applies also to M_{iG} and M_{iI}^F) $M_{iC} = [\sum_r \delta_{ri} M_{ric}(\eta_i-1)/\eta_i] \eta_i/(\eta_i-1)$

C. Constraints and Balancing Items

12. Agent's Budget Constraint ($u_i = 0$ if NTBs are frictional) $\sum_i \tilde{p}_i^C C_i = w_K \bar{E}_K + w_L \bar{E}_L + eB - \sum_i \tilde{p}_i^{IF} I_i^F - \sum_i p_i I_i^I + D + \sum_i \sum_r u_{ri} p_{ri}^m M_{ri} + \sum_i v_i Y_i$
13. Government Budget Constraint $\sum_i \tilde{p}_i^G G_i = D + \sum_i \tau_{Ki} w_K K_i + \sum_i \tau_{Ci} (\tilde{p}_i^C C_i + \tilde{p}_i^{IF} I_i^F) + \sum_i \sum_r (1+\tau_{Ci}) t_{ri} p_{ri}^m (M_{riC} + M_{riI}^F)$
14. Current Account Balance $B = \sum_r \sum_i (1/e) (p_{ri}^m M_{ri} - p_{ri}^x X_{ri})$
15. Product Market Clearance $S_i = \sum_j a_{ij} Y_j + G_i + I_i^F + I_i^I + C_i$
16. Factor Market Clearance $\sum_i K_i = \bar{E}_K; \sum_i L_{1i} = \bar{E}_{1L}, \sum_i L_{2i} = \bar{E}_{2L}, K_j = \bar{E}_{Rj}$
17. Zero Profits $p_i D_i + \sum_r p_{ri}^x X_{ri} = c_i Y_i$
18. Supply Value Balance $\tilde{p}_i S_i = \tilde{p}_i^Z \sum_j a_{ij} (1+v_j) Y_j + (1+\tau_{Ci}) (\tilde{p}_i^C D_i C + \tilde{p}_i^{IF} D_{iI}^F) + \tilde{p}_i^G D_i G + \tilde{p}_i^{IF} I_i^I + \sum_r (1+\tau_{Ci}) (1+u_i+t_{ri}) p_{ri}^m (M_{riC} + M_{riI}^F) + \sum_r (1+u_i+t_{ri}) p_{ri}^m M_{riG}$

D. Price Relationships and Identities

19. Components of Domestic Sales $D_i = D_{iC} + D_{iI}^F + I_i^I + D_{iG}$
20. Components of Import Sales $M_i = M_{iN} + M_{iC} + M_{iI}^F + M_{iG}$

21. Domestic Price of Intermediate Imports $p_{ri}^N = (1 + u_i + t_{ri})p_{ri}^m$
(holds also for imports for G)
22. Domestic Price of Imports for C $p_{ri}^C = (1 + \tau_{Ci})(1 + u_i + t_{ri})p_{ri}^m$
(holds also for imports for I^F)
23. Consumer Price of Domestic Goods $p_i^C = (1 + \tau_{Ci})(1 + v_i)p_i$
(holds also for purchases for I^F)
24. Capital-Market Equilibrium $\tau_{K1} + w_{K1} = \dots = \tau_{Kn} + w_{Kn}$ (mobile capital sectors)

LIST OF VARIABLES

L_{1i}, L_{2i}	Production and non-production labor inputs, sector i ($i=1,...,38$)
L_i	Aggregated labor input, sector i
K_i	Capital inputs, both mobile and immobile
V_i	Value added
M_i	Total imports
M_{ri}	Imports from region r ($r = \text{EU, ROW}$)
M_{iN}	Imports of commodity i for intermediate use
m_{riN}	Imports for intermediate use from region r ($r = \text{US, EU, MENA, ROW}$)
z_{ji}	Composite intermediate input of j into i ($j=1,...,38$)
d_{ji}, m_{ji}	Intermediate usages of domestic and imported goods
Y_i	Output of good i
D_i, X_i	Output for domestic sales and exports
D_{iC}, D_{iG}, D_{iI}^F	Domestic sales: private and public consumption, and capital formation
X_{ri}	Exports of good i to region r
c_i	Index of marginal cost of production
p_i	Domestic producer price index
$\tilde{p}_i^Z, \tilde{p}_i^C, \tilde{p}_i^{IF}, \tilde{p}_i^G$	Domestic price indexes (home and imported prices)
w_K, w_L	Factor price indexes (where w_K is fixed in resource-constrained sectors)
U	Utility
\tilde{p}_i	Composite price index for total domestic supply
C_i, G_i	Private and public consumption
I_i^F, I_i^I	Fixed capital formation and inventory investment
M_{iC}, M_{iG}	Imports for private and public consumption
M_{iI}^F	Imports for fixed capital formation
M_{riC}, M_{riG}	Imports for private and public consumption from region r
M_{riI}^F	Imports for fixed capital formation from region r

e	Real exchange rate (price index for foreign exchange)
B	Current-account balance
D	Government budget deficit (held fixed)
S_i	Supply on domestic market ($D_i + M_i$)
p_{ri}^N	Domestic price index for intermediate imports
p_{ri}^C, p_{ri}^G	Domestic price indexes for imports for private and public consumption
p_{ri}^F	Domestic price index for imports for gross capital formation
p_i^C, p_{ii}^F	Price index for private consumption/fixed capital of domestic goods
p_{ri}	Producer price index for goods exported to region r
τ_{Ci}	Endogenous tax rate on consumption ("goods and services tax")

LIST OF PARAMETERS

σ_L	Substitution elasticity between labor types
σ_i	Substitution elasticity between capital and labor
η_a	Substitution elasticity between intermediates and value added
η_i	Armington elasticity between EU and ROW imports
η_j	Substitution elasticity between domestic and imported intermediates
ε_i	Transformation elasticity between domestic and exported output
e_i	Transformation elasticity between EU and ROW exports
ψ_i	Substitution elasticity between domestic and imported consumption
τ_{Ki}	Tax rate on operating surplus ("capital tax")
τ_{ri}	Tariff rate on imports from region r
u_i	NTB administrative cost rate on imports
v_i	Service sector rents on domestic output ($v_i=0$ for non-service sectors)
$\bar{E}_K, \bar{E}_{1L}, \bar{E}_{2L}, \bar{E}_{Rj}$	Endowment of capital, labor, and resource-constrained capital
p_{ri}^m	Price of imports from region r
p_{ri}^x	Price of exports in region r

Policy Research Working Paper Series

Title	Author	Date	Contact for paper
WPS2110 Life during Growth: International Evidence on Quality of Life and Per Capita Income	William Easterly	May 1999	K. Labrie 31001
WPS2111 Agricultural Land Reform in Postwar Japan: Experiences and Issues	Toshihiko Kawagoe	May 1999	P. Kokila 33716
WPS2112 Industrial Policy after the East Asian Crisis: From "Outward Orientation" To New Internal Capabilities?	Ashoka Mody	May 1999	S. Kpundeh 39591
WPS2113 Wage Determination and Gender Discrimination in a Transition Economy: The Case of Romania	Stefano Paternostro David E. Sahn	May 1999	N. Nouviale 34514
WPS2114 Economic Reforms and Total Factor Productivity Growth in Latin America And the Caribbean (1950-95): An Empirical Note	Pablo Fajnzylber Daniel Lederman	May 1999	S. Holt 37859
WPS2115 Foreign Investment and Productivity Growth in Czech Enterprises	Simeon Djankov Bernard Hoekman	May 1999	R. Vo 33722
WPS2116 Does Child Labor Displace Schooling? Evidence on Behavioral Responses to an Enrollment Subsidy	Martin Ravallion Quentin Wodon	May 1999	P. Sader 33901
WPS2117 On the Size and Number of Regional Integration Arrangements: A Political Economy Model	Soamiely Andriamananjara	May 1999	L. Tabada 36896
WPS2118 Developing Countries and the Next Round of Multilateral Trade Negotiations	Anne O. Krueger	May 1999	L. Tabada 36896
WPS2119 Tax Deductions, Environmental Policy, and the "Double Dividend" Hypothesis	Ian Parry Antonio Bento	May 1999	R. Yazigi 37176
WPS2120 Can Africa Export Manufactures? The Role of Endowment, Exchange Rates, and Transactions Costs	Ibrahim A. Elbadawi	May 1999	C. Bernardo 31148
WPS2121 Fiscal Management in Federal Democracies: Argentina and Brazil	William Dillinger Steven B. Webb	May 1999	A. Lara 68148
WPS2122 Decentralization and Fiscal Management in Colombia	William Dillinger Steven B. Webb	May 1999	S. Webb 38680

*
Policy Research Working Paper Series

Title	Author	Date	Contact for paper
WPS2123 Access to Land in Rural India	Robin Mearns	May 1999	G. Burnett 82111
WPS2124 Social Exclusion and Land Administration in Orissa, India	Robin Mearns Saurabh Sinha	May 1999	G. Burnett 82111
WPS2125 Developing Country Agriculture and The New Trade Agenda	Bernard Hoekman Kym Anderson	May 1999	L. Tabada 36896
WPS2126 Libert�, Egalit�, Fraternit�: Exploring the Role of Governance In Fertility Decline	Monica Das Gupta	May 1999	M. Das Gupta 31983
WPS2127 Lifeboat Ethic versus Corporate Ethic: Social and Demographic Implications of Stem and Joint Families	Monica Das Gupta	May 1999	M. Das Gupta 31983
WPS2128 Learning Outcomes and School Cost-Effectiveness in Mexico: The PARE Program	Gladys Lopez Acevedo	May 1999	M. Geller 85155
WPS2129 Agricultural Extension: Generic Challenges and Some Ingredients for Solutions	Gershon Feder Anthony Willett Willem Zijp	May 1999	P. Kokila 33716